

AMPRO
MODEL 745 "Career"

GENERAL INFORMATION

The Ampro Model 745 is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time of a reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker or an external speaker through use of the Speaker Jack.

The Model 745 has two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks of the tape the recording time is as follows.

Size Reel	3 3/4" Speed	7 1/2" Speed
5" reel (600 ft.)	1 hour	1/2 hour
7" reel (1200 ft.)	2 hours	1 hour

This unit is designed to operate on 60 cycle, 115 volt, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Manufactured by:

Ampro Corporation
1345 Diversey Parkway
Chicago 14, Illinois

This material compiled and published by

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AMPRO
MODEL 745 "Career"

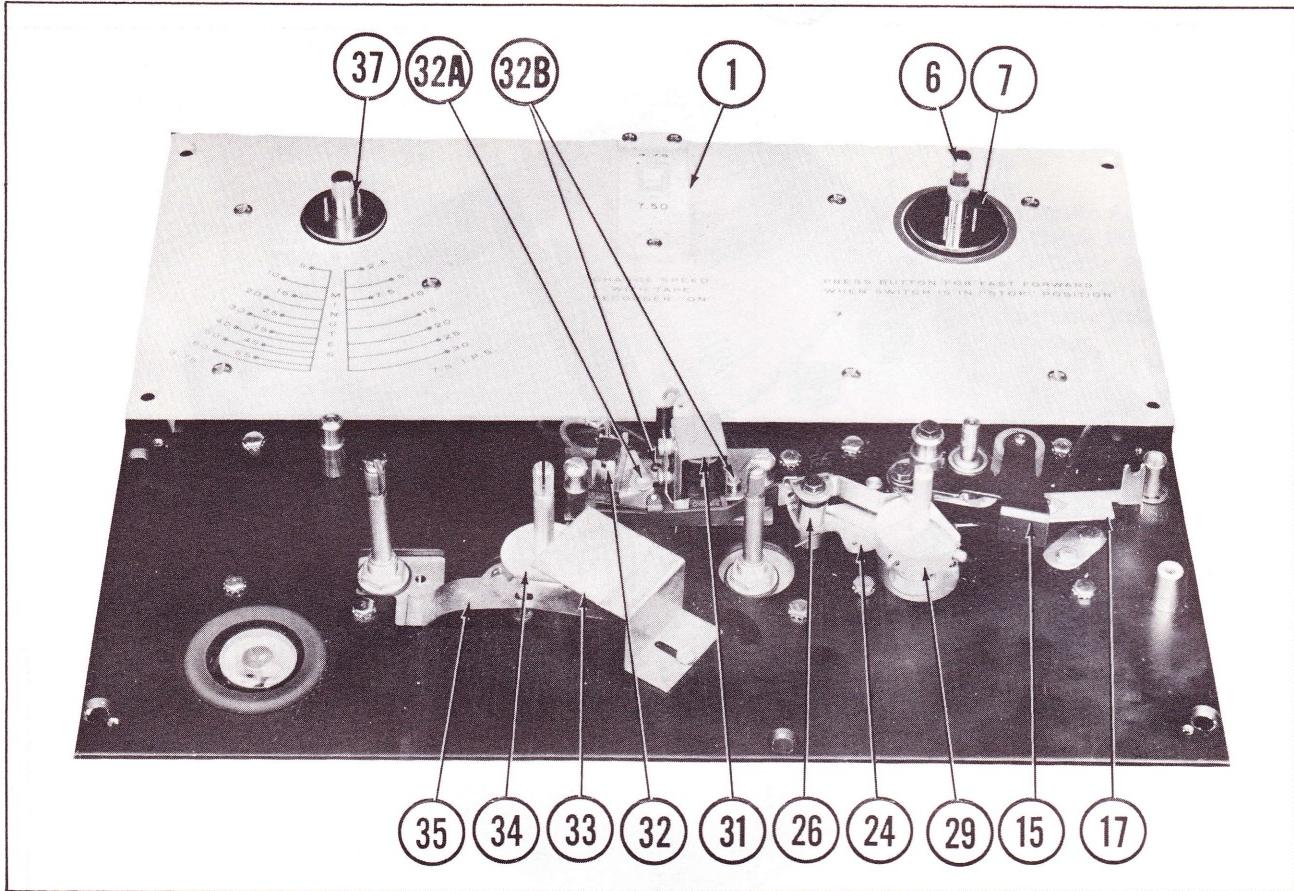


Figure 1

OPERATING INSTRUCTIONS

Preparation For Operation-

1. Remove the AC power cord 5" reel of tape, empty reel and microphone from the rear storage compartment.

2. Plug the AC cord into a convenient wall receptacle of the proper rating.

3. Be sure the Play-Stop-Rewind control is in "stop" position and the Play-Record control is in "play" position.

Speed Change Knob-

Select tape speed with the unit on. Moving switch upward will cause the unit to play at the speed of 3.75, moving switch downward the unit will play at a speed of 7.50. For maximum tape economy or for recording the spoken voice, 3.75 I.P.S. is suggested. The best for music and maximum fidelity is the speed of 7.50 I.P.S.

Threading The Tape-

1. Place a full reel of tape on the left (supply) spindle (37), making certain one of the reel slots catch the protrusions of the pan. Unwind about 14" of tape from the supply reel.

2. Insert free section of tape into the tape slot.

3. Insert free end of tape into one of the three slots in the hub of the right (take-up) reel and while holding the tape in place give the reel two or three turns until the tape is secured.

4. The dull side of the tape should always face away from the operator (rear of unit).

To Record From Microphone-

1. Turn the On-Off Volume control to the right until a click is heard and allow about 30 seconds for the unit to warm up.

2. Insert the microphone plug into the "Microphone" input.

3. Press down "Safety Button" and turn Play-Record control to "Mic. Record" position.

4. Adjust the "Volume" control until the Record Level Eye, green rays almost meet on loudest sounds, recording level is perfect at this point.

5. The "Tone" control does not operate during recording. When recording from radio, set the radio "Tone" control for maximum treble.

To Record From External Radio, TV, Or Phonograph-

1. You may record directly from the speaker by using the special radio-phono connection cord, available as accessory No. 108. (This cord has a telephone-type jack at one end, and two metal clips at the other).

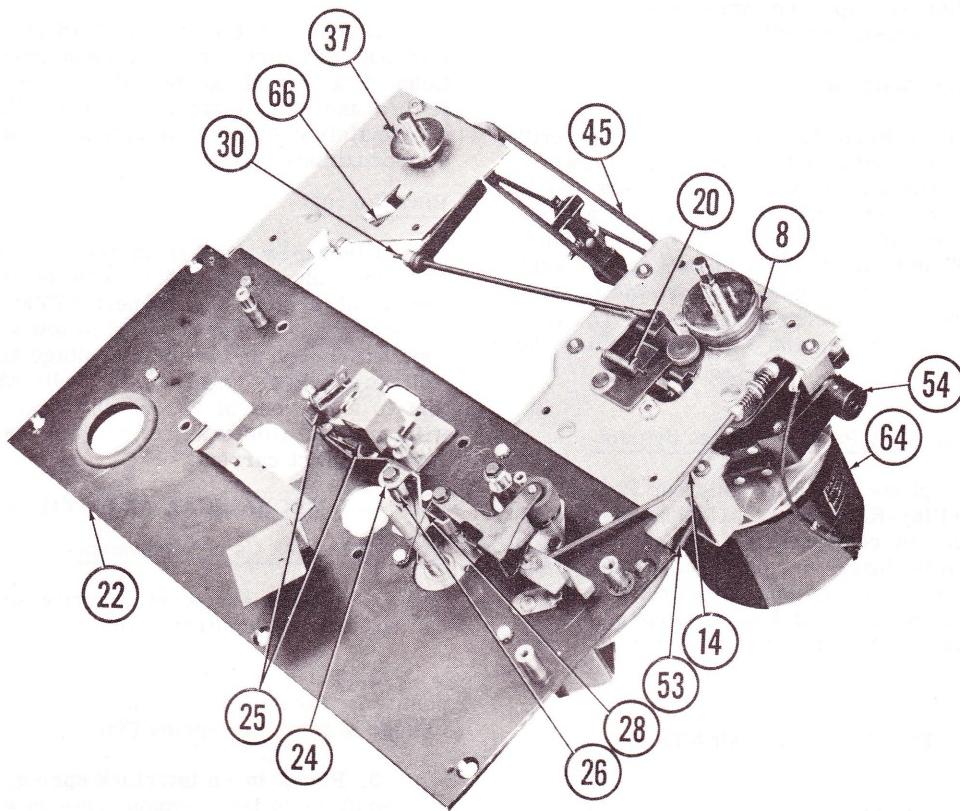


Figure 2

2. Attach one clip to the ungrounded side of the radio, TV or phono speaker coil. The other clip is attached to the grounded side of the coil.

3. Plug the Jack into the receptacle on side of your unit marked "Mic or Phono," and proceed as described under "To Record From Microphone".

NOTE: Remove patch cord after recording is completed.

To Use Second Track-

1. Move Play or Record-Stop-Rewind lever to the "Stop" position when all the tape has wound onto the take-up reel.

2. Remove reel containing tape and place on left-hand supply spindle.

3. Place empty reel on right-hand take-up spindle.

4. Thread tape as previously described.

To Play Recordings-

1. Turn on unit with "Volume" control knob.

2. Thread tape as described under "Threading The Tape".

3. Set the speed change knob (1A) to the speed at which the recording was made.

4. Turn Play-Stop-Rewind lever to play.

5. Adjust "Volume" and "Tone" controls to de-

sired listening level.

6. To stop, return Play-Stop-Rewind lever to "Stop".

Fast Forward Tape Advance-

1. Leave Play-Stop-Rewind lever in "Stop" position.

2. Hold down "Fast Forward Button" (6) on top of right reel spindle (7).

3. Release when tape has advanced to location on the tape you wish to hear or record.

To Rewind-

1. Before rewinding, return Play-Record control to "Play" position.

2. Turn Play-Rewind lever to "rewind". Rewind tape to beginning of your recording and return lever to stop.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material-

When the Play-Record knob (3) is in the "Record" position, the erase head is automatically in operation, erasing any previous recording before a new one is made. You may erase material no longer needed, without recording, by moving the Play-Record knob (3) to "Record" on turning the "Volume" control knob to the minimum volume position just before the recorder shuts off. One track is erased at a time. To erase the second track, reverse the reels and repeat the above operation.

To Use Recorder As A Public Address System-

Plug microphone cord into "Mic. or Phono" receptacle. Turn Play-Record control to "phono-record" position. Be sure microphone is far enough away from speaker to avoid feedback squeal. Volume may be adjusted with Volume control. Mike and/or radio-phono can be simultaneously used for blending of special effects in public address use with Ampro Dual - Input Mixer, No. 133.

ELECTRICAL ADJUSTMENTS

Erase Head Adjustment-

1. Loosen screws located on the left side of erase head and raise or lower head and tilt head as required in order to obtain minimum output.
2. Then loosen screw (32A) and rotate positioning block for minimum output.
3. Tighten screw (32A) and rotate positioning block for minimum output.
4. Check for opposite track erasure if excessive, head is set too low.

Record Head Adjustment-

The record head is mounted on a pivoted plate which is held in place by two filister head screws (32B) located at opposite corners of the plate. Tightening or loosening the screw on the left (viewed from operating position) rocks the pivoted plate thereby changing the angular relationship between the gap and the tape and increasing or decreasing the compression of the spring located under the head of the opposite mounting screw. In order to make an adjustment, thread the recorder with pre-recorded 1 mil alignment tape or a good recorded tape on the machine.

Connect an output meter across the terminals of the elliptical speaker. Switch recorder to "play" position and set the volume control to the 12 o'clock position. Rotate the screw which secures the left side of the plate in order to obtain maximum output from the pre-recorded material. Make a rough adjustment at a tape velocity of 3.75 inches per second the switch to 7.50 inches per second for final adjustment.

NOTE: Watch out for a false peak you may find 3 peaks - be sure to adjust for strongest peak.

Erase Current-

Disconnect the ground lead at the erase head terminal and insert a 10 ohm non-inductive resistor. Connect a VTVM across the resistor. Switch to record and note voltage. Correct voltage will be approximately 0.4-0.5 volts indicating an erase current of approximately 40-50 ma.

Bias Current-

Disconnect lead from record head. Insert 100 ohm non-inductive resistor between red lead and record head terminal and connect VTVM across 100 ohm resistor. Turn volume control to low volume position. Switch to record and measure voltage across resistor. Voltage should be "0.40 - 0.45" volts which is equivalent to a current of "0.40 - 0.45 ma. If bias is not within these limits adjust slug in oscillator coil to obtain correct current.

MECHANICAL ADJUSTMENTS

Erase Interlock Cam Adjustment-

1. Loosen set screw slightly so that cam (34) can be turned on control shaft.
2. Turn shaft to maximum clockwise "Play" position. Rotate cam so that flat surface is parallel to edge of interlock spring (35).
3. Press in on interlock spring, then turn control shaft in order to expose setscrew. Tighten set-screws.

Rewind-Play Or Record Cam (29) Adjustment-

1. Turn control shaft to maximum counter-clockwise (Play or Record) position.
2. Loosen setscrews in cam. Rotate cam so that cam flat is parallel to flat surface of pad actuating arm (24).
3. Raise or lower cam (29) as required in order to locate top face of cam in the same plane as top of arm (24). Tighten setscrews.
4. Place light film of "Lubriplate" on surface of cam which comes in contact with arm (24).

Disassembly Instructions-

1. Take out the four Phillips filister head screws located at the corners of the panel (5). Loosen the two allen setscrews in the "Rewind-Play or Record" knob (3) and remove the knob. Pull off the other three knobs (2). Lift off the control panel (5).
2. Remove three phillips oval head screws which hold speed change control cover (1) in place and lift off cover.
3. Take out ten phillips oval head wood screws which hold metal panels to case.
4. Loosen cable clamp which holds line cord to back of carrying case. Stand recorder on end and pull mechanism out of case.

Takeup Brake Adjustment-

Place "Rewind-Play or Record" knob in "Play"

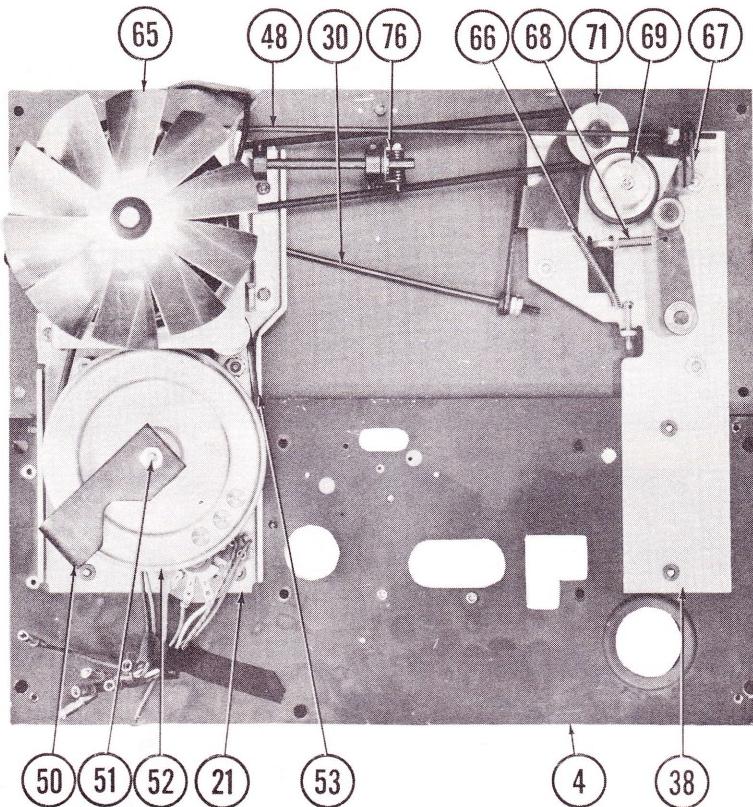


Figure 3

position. Loosen locknut on adjustment screw (19A) and turn screw to provide a clearance of $1/64$ " between shoe (19) and tire (8). Tighten locknut.

Feed Spindle Brake Adjustment-

Place "Rewind-Play or Record" knob (2) in "Play" position. Loosen double nuts at end of brake rod (48). Adjust nuts to provide a clearance of $1/32$ " between shoe (67) and tire (70). Rotate feed spindle and check to make sure that eccentricity, if present, does not reduce clearance below minimum value of $1/32$ ". Tighten locking nut.

Instant Stop Link-

Set inner nut of link (14) $1\frac{5}{32}$ " from end of link (14). Set outer nut flush with end of link.

Rewind Adjustment-

Place "Rewind-Play or Record" knob in "Play" position. Loosen double nuts at end of pushrod (30). Adjust nuts to provide a clearance of $1/64$ " between rewind drive belt (45) and knurled section of drum (69).

NOTE: If rewind does not function properly, and the rewind belt (45) is not damaged, the trouble is probably due to excessive take-up tension.

Takeup Adjustment-

- Cement 8-10" of tape or string to the hub of a 7" reel. Place reel on takeup spindle and hook a spring balance scale (0-8 oz. or 0-16 oz) to the loose end of the tape or string. Switch recorder to "play"

measure the takeup tension-correct tension should be $1/2$ to 1 oz.

- If takeup tensions are incorrect, remove recorder from case. Loosen two setscrews which hold the intermediate drive pulley (47) to takeup drive spindle and pull out spindle assembly.

- Grasp the spindle by the shank (9), hold spindle in a vertical position with the reel drive pins on top. Hook the spring balance scale to one of the reel drive pins and pull along a line as a right angle to a line thru the center of the spindle post and pin. The "breakaway" tension required to rotate the spindle should be 3 to 5 oz. In order to adjust the tension, invert the spindle and insert the ends of the jaws of a pair of longnose pliers into the two holes in the clutch pressure plate (12). Turn the plate to the right to increase the tension.

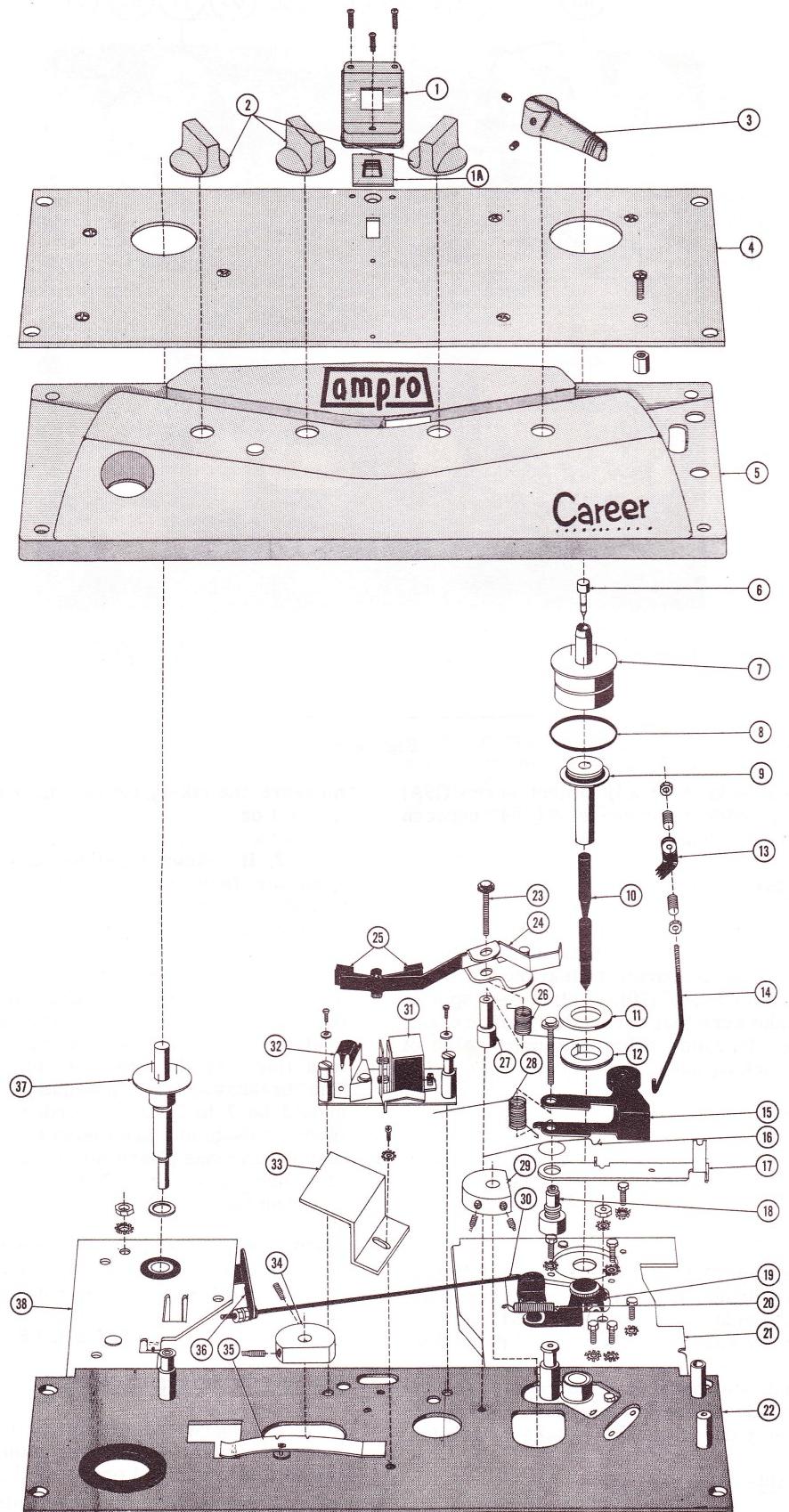
NOTE: This adjustment is sensitive when making adjustment, do not turn the plate more than the width of one of the holes between tests.

TROUBLES

Whining Or Scrapping Noise-

- The recorder is shifted in the case, the bottom end of the motor shaft rubs against the guide sleeve in the bottom cover and produces the noise.

- Reposition the mechanism in the case and tighten the retaining screws. If the holes in the support blocks are damaged, the best way to make a permanent repair is to inject plastic wood into the hole before inserting the screws.



A PHOTOFAC "EXPLODED" VIEW
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Figure 4A. Exploded View Of Parts Above Baseplate.

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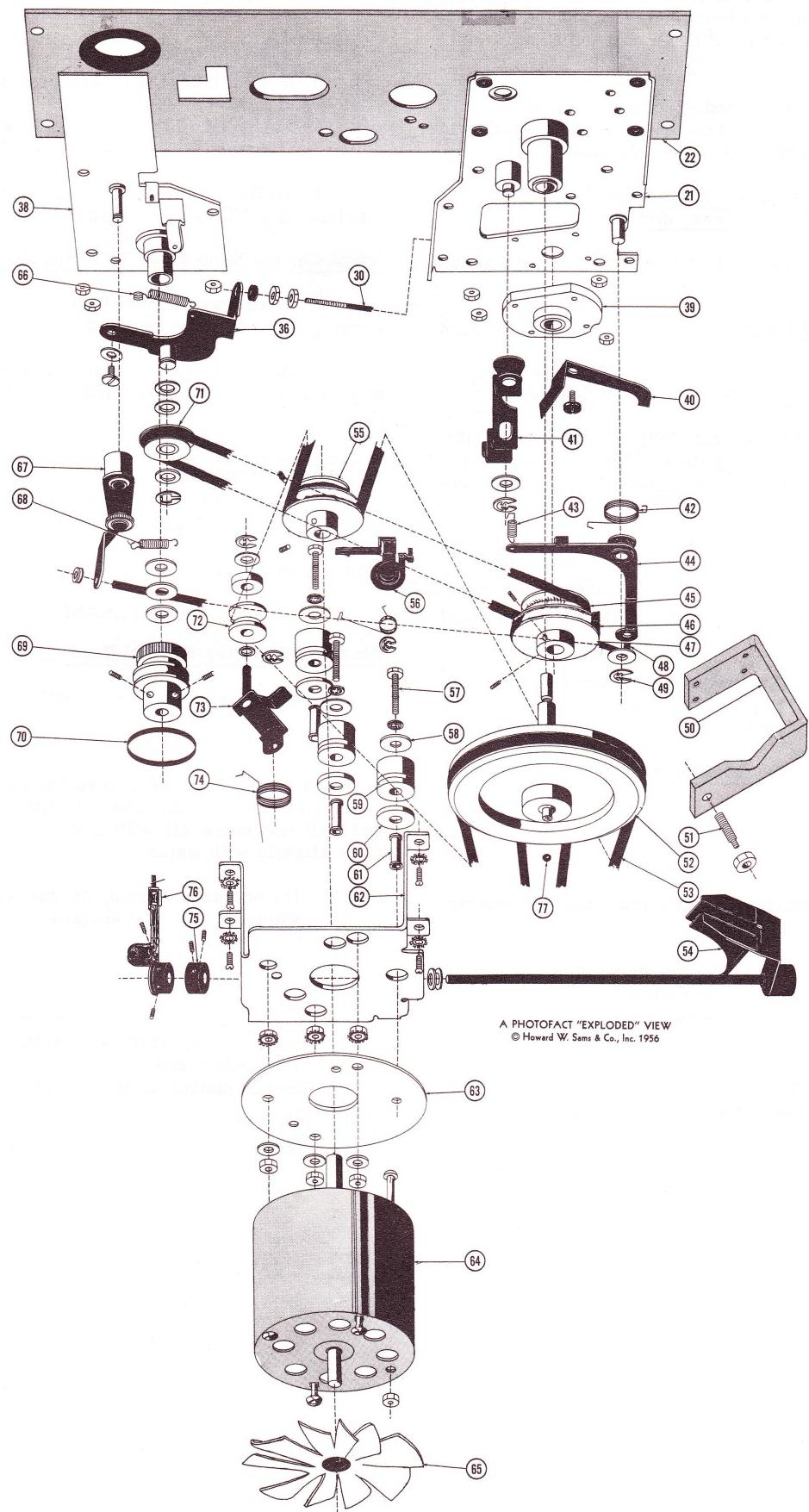


Figure 4B. Exploded View Of Parts Below Baseplate.

Fails To Record-

1. Tape pressure pads (25) not adjusted properly, resulting in the tape not being held against the recording head. See "Rewind - Play Or Record Cam Adjustment".

2. Check the recording tape to see if the dull coated side faces inward on the reel. If the dull side faces outward a recording cannot be made.

Tape Overruns Or Spills When Knob (3) Is Turned To Stop, During Rewind Or Fast Forward-

1. Brake shoes out of adjustment. See Takeup and Feed Reel Brake Adjustments.

2. Rods (30 and 48) loose are not adjusted properly.

Speed Variation Or Wow-

1. Check the capstan (52), pinch roller (15), motor pulley (55), and flywheel (52) for oil or foreign material on their driving surfaces. Clean these parts with a good cleaning fluid.

2. Check motor pulley (55) to see if it is secured to motor shaft.

3. Flat spot on rubber roller (15) not smooth and even, replace part.

4. Pressure Pad assembly (24) applying too much pressure against tape. Check adjustment under "Rewind-Play Or Record Cam (29) Adjustment."

Incorrect Indexing Of Function Knob (2)-

1. The control knob (2) is in Play position the safety interlock button (5A) prevents the shaft from turning.

2. If the operator forces the knob, thereafter, it will not index correctly.

3. Pull of the knob and drive down a wedge, thereby expanding the shaft, then place the knob in the proper position and push down onto the shaft.

No Drive In Fast Forward-

1. Belt (46) loose or broken, thereby when button (6) is depressed fast forward is in-operative.

2. When button is depressed the felt clutch (11) does not make contact, adjust takeup as described under "Takeup Adjustment".

No Rewind-

1. Rewind belt (45) broken or loose.

2. Push rod (30) not properly adjusted, check adjustment under "Rewind Adjustment".

3. No Rewind can be caused by excessive takeup tension. See "Takeup Adjustment".

Speed Change Knob Fails To Change Speed-

1. Setscrews in speed change lever (76) loose causing lever to move on shaft.

2. Belt shifter (54) not adjusted properly. Check to see that shifter moves belt (53) up and down on pulley (55).

Erase Current Too Low-

1. Some 6AQ5 tubes did not deliver full output as oscillators. The cathode resistor was changed from 1500 ohms to 1200 ohms in order to insure satisfactory output from all tubes.

MAINTENANCE

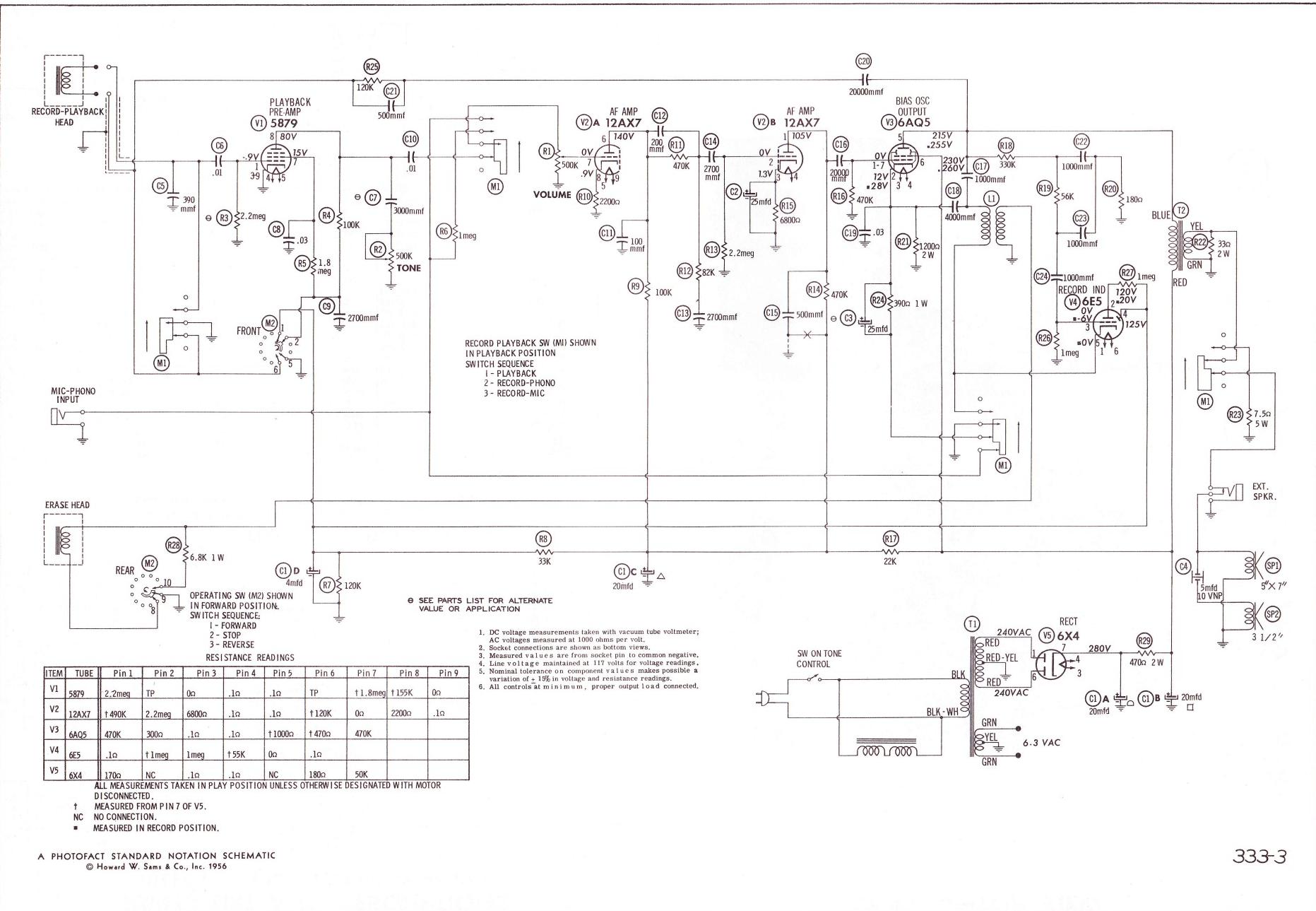
Cleaning The Play-Record Head-

The play-record head is subject to an accumulation of tape coating residue which is worn off the tape as it passes the head. This should be periodically removed since it may cause faint recordings and poor playback. Wipe off the record head contact surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen the cloth slightly with water.

NOTE: Do not use a brush or excessive amount of water on the head surface.

LUBRICATION

All rotating parts are provided with generous size oilite bearings, which are factory lubricated and require no further attention. An occasional cleaning out of foreign matter under the plastic cover (5) is desirable.

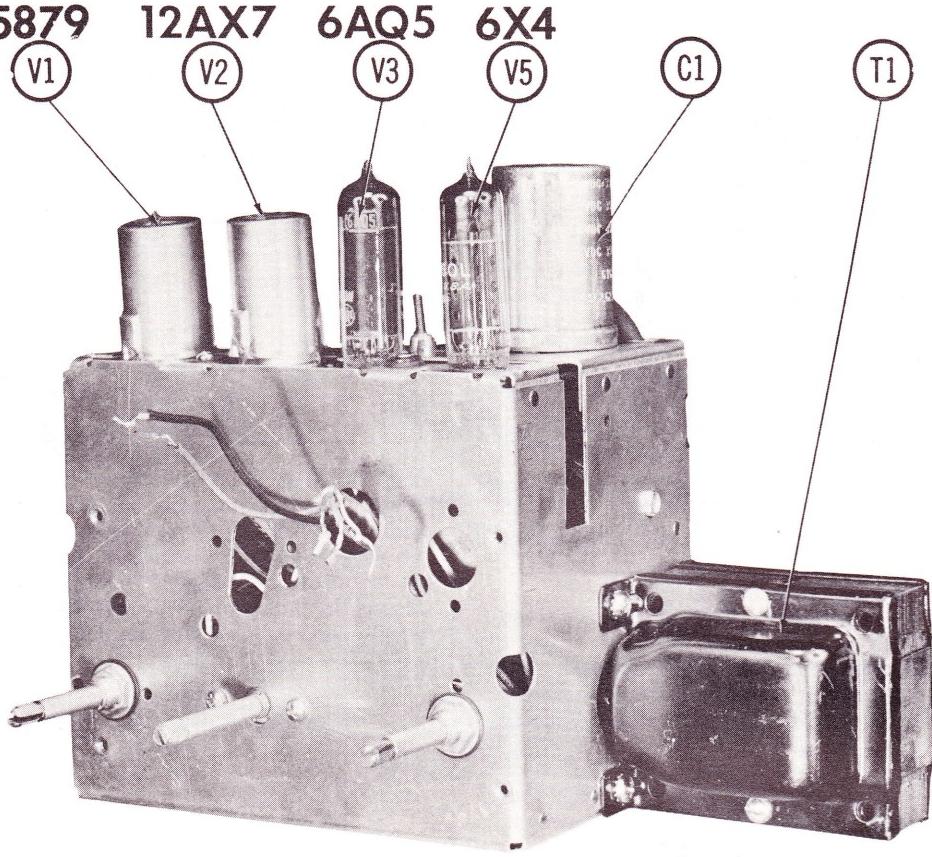


PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Playback — Preamplifier	56879	
V2	AF Amplifier	12AX7	
V3	Bias Osc. - Audio Output	6AQ5	

ITEM No.	USE	TYPE	NOTES
V4	Record Ind	6E5	
V5	Rectifier	6X4	

ELECTROLYTIC CAPACITORS



Note #1. Non-Polarized Unit.
† Connect Negative Leads Together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	AMPRO PART No.		AEROVOX PART No.	CENTRALAB PART No.	CORNELL- DUBLINER PART No.	REPLACEMENT DATA		NOTES
	RATING CAP. VOLT	AMP PART No.				ERIE PART No.	MAILLOY PART No.	
C5	390	500	1B1204	BPD-01	D6-103	5RST39	GP-10000	MS-339
C6	.01	400	17782	DI-003	DD-302	CUB451	ED-003	4TMM-5L
C7	.0001	400		BPD-03	DD-303	CUBBS3	PT413	5GA-D3
C8	.03	400	1B732	DI-0027	DD-312	K075	ED-0027	4TMM-5L
C9	2700	100	1B1185	BPD-01	D6-103	CUB451	GP-10000	5GA-D27
C10	.001	400	1B1185	SIU100	D6-101	TP34	GP-1000	PT-411
C11	.100	18493	1B7782	SIU100	SI200	TP38	GP-1000	5GA-T1
C12	.200	1B1204		SI200	D6-201	TP38	GP-1000	5GA-T2
C13	.2700	1B1733		SI2700	D6-272	TP59	GP-2700	5GA-D27
C14	.2700	1B1185		SI2700	D6-272	TP59	GP-2700	5GA-D27
C15	.500	1B1558		SI500	DI-0027	TP47	GP-0027	5GA-T5
C16	20000	1B1707		SI500	DI-0027	TP47	GP-0027	5GA-T5
C17	1000	1B1202		SI1500	BPD-02	DD-203	ED-002	PT412
C18	4000	1B1148		SI1500	1B1400	K085	ED-002	5HK-S2
C19	.03	150	1B1148	1B1400	1B1400	IR5D4	MCB4863	MS-21
C20	20000	1B1707		1B1558	BPD-03	CU9653	PT413	MS-24
C21	.500	1B1558		1B1558	BPD-02	DD-203	ED-02	4TMM-5L
C22	1000	1B1202		1B1202	D6-501	K085	PT412	5HK-S2
C23	1000	1B1202		1B1202	D6-501	IR5D4	ED-1000	MS-21
C24	1000	1B1202		1B1202	D6-501	IR5D1	ED-1000	MS-21

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CONTROLS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
		AMPRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	
RIA B	500K 1/2	◆ 181176	AB-60	A47-500K-Z KS53	Q1-133 Not Req.	U48 Shaft (Attach to RIA)
C			AK-60			
R2A B	500K 1/2	181143	KB-1 AB-59 AK4	A47-500K-S KS53	76-1 Q1-133 Not Req.	US26 Switch (Attach to RIA) U50 Tone Shaft (Attach to R2A)

Mme. Partis List 18709

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AMPRO PART No.	IRC PART No.	NOTES
R3	2.2meg	16465	BTS-2.2meg		
R4	10K	16471	BTS-10K		
R5	1.6meg	16436	BTS-1.6meg		
R6	Imeg	17538	BTS-1meg		
R7	120K	18116	BTS-120K		
R8	33K	18632	BTS-33K		
R9	100K	18471	BTS-100K		
R10	2200Ω	18472	BTS-2200		
R11	470K	18474	BTS-470K		
R12	82K	181150	BTS-82K		
R13	2.2meg	16465	BTS-2.2meg		
R14	47K	18474	BTS-47K		
R15	680Ω	181135	BTS-680Ω		

Note #1. 470KΩ @ 1/2 W Resistor (Part #18474) Used In Some Versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRIL.	SEC. 1 PRIL.	SEC. 2 PRIL.	SEC. 3 PRIL.	REPLACEMENT DATA AMPRO PART No.	REPLACEMENT DATA Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	Tried PART No.
T1	117VAC (@ .29A)	465VCT (@ .030A)	6.3VCT (@ 1.8A)		181155	P9200①	P-3149①	PC-8418①	24R00U①	R-6A①	

① Tape 5V, 2A Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	USE	DC RES. PRIL.	AMPRO PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Tried PART No.	NOTES
T1	3-4Ω	181166	Z1002	A-2901	A-3849	24S61		S-9Z		

COILS (RF-IF)

ITEM No.	USE	DC RES. PRIL.	AMPRO PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Tried PART No.	NOTES
T2	Osc. Coil	1.8Ω	2.3Ω	181144						

SPEAKER

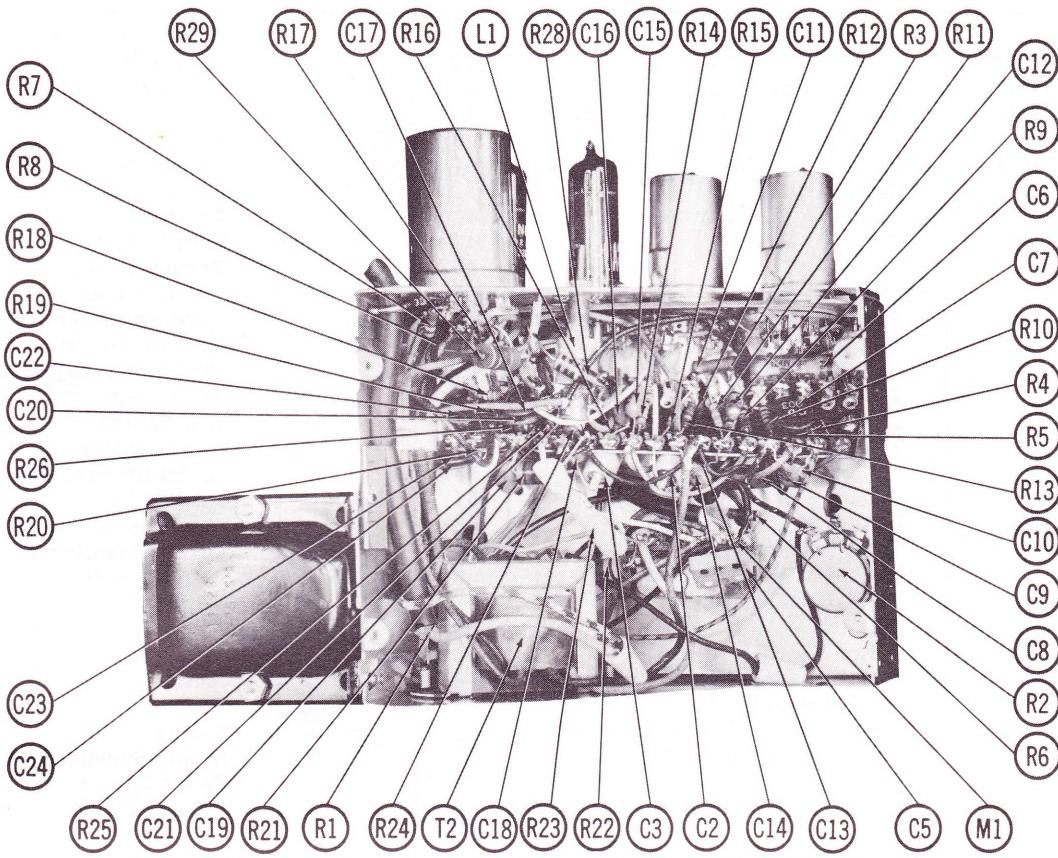
ITEM No.	RATINGS FIELD V. PM	C. IMP. PM	REPLACEMENT DATA AMPRO PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA QUAM PART No.	RCA TYPE No.	NOTES
L1	5377 3	2.3Ω 3-4Ω	18775 181198	57A21 3A15TZ3.3	233SI		

MISCELLANEOUS

ITEM No.	PART NAME	AMPRO PART No.	NOTES
SPI	Switch	181145	Record-Playback (Slide Type)
SPI2	Switch	181146	Operating (Rotary, Wafer Type).

MODEL 745 "CARRIER"
AMPRO

CHASSIS—BOTTOM VIEW



MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Speed Change Cover	39		Capstan Bearing & Housing
1A	75636-2	Speed Change Knob	40		Instant Stop
2	74612	Control Knob	41		Bell Crank & Link
3	74631	Record - Play - Stop-Rewind	42		Spring
4		Rear Plate	43		Spring
5	74614-1	Front Escutcheon	44		Rewind Brake Actuating Lever
5A		Safety Button	45		Rewind Drive Belt
6	74206	Fast Forward Button	46		Forward Drive Belt
7		Take-Up Spindle	47		Intermediate Reel Drive Pulley
8		"O" Ring	48		Rewind Brake Push Rod
9		Take-Up Drive Hub Drum	49		"C" Retainer
10		Fast Forward Actuating Shaft	50		Flywheel Support Bracket
11		Felt Clutch	51		Vertical Position Screw
12		Adjusting Disc	52		Flywheel & Capstan
13		Pivot Arm	53		Drive Belt
14		Pull Rod	54		Belt Shifter
15		Pinch Roller Assy.	55		Motor Pulley
16		Instant Stop Arm Spring	56		Brake Release Arm
17		Instant Stop Arm	57		Screw
18		Instant Stop Arm Pivot	58		Washer
19		Take-Up Brake Arm	59		Motor Mounting Shocks
20		Take-Up Brake Arm Spring	60		Rubber Washer
21		Take-Up Mounting Plate	61		Spacer
22		Baseplate	62		Motor Mounting Bracket
23		Screw	63		Motor Mounting Plate
24		Pad Actuating Arm	64		Motor
25	16903	Head Pressure Pads	65		Fan
26		Pad Actuating Arm Spring	66		Spring
27		Pad Actuating Arm Pivot	67		Supply Spindle Brake
28		Pinch Roller Spring	68		Brake Spring
29		Play-Record Cam	69		Rewind Brake Drum
30		Push Rod	70		"O" Ring
31	74619	Recording Head	71		Rewind Pulley
32	74618	Erase Head	72		Idler Pulley
33		Escutcheon Support	73		Idler Arm
34		Erase Interlock Cam	74		Idler Spring
35		Interlock Spring	75		Speed Shifter Stop
36		Rewind Driver Arm	76		Speed Change Lever
37		Rewind Spindle	77	16403	Steel Ball Capstan Support
38		Rewind Mounting Plate			

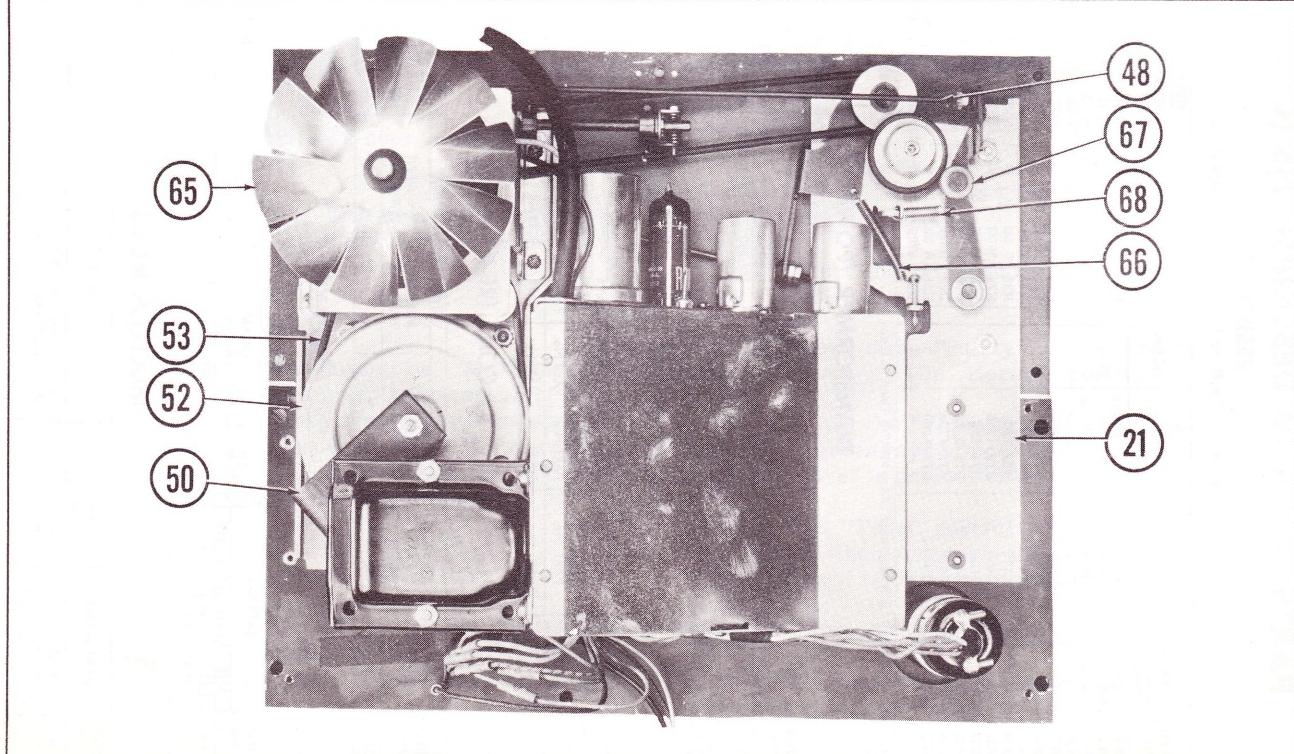


Figure 5